

the image is read out in normal form from all of the plurality of memory means after the recording is completed.

REMARKS

Claims 1-7 and 25-31 are now presented for examination. Claims 1-3 and 25-27 have been amended to define still more clearly what Applicants regard as their invention, in terms which distinguish over the art of record. Claims 1 and 25 are the only independent claims.

Claims 1 to 7 and 25 to 31 have been rejected under 35 U.S.C. § 102(b), as anticipated by U.S. Patent No. 5,544,338 (Forslund). Reconsideration and withdrawal of the rejection respectfully are requested in view of the above amendments and the following remarks.

The rejection of the claims over the cited art respectfully is traversed. Nevertheless, without conceding the propriety of the rejection, Claims 1 to 3 and 25 to 27 have been amended herein more clearly to recite various novel features of the present invention, with particular attention to the Examiner's comments. Support for the proposed amendments may be found in the original application. No new matter has been added.

Independent Claim 1 as amended by this amendment is directed to a camera in which plural image pickup units pick up plural images of an object, respectively. A display unit displays images picked up by the plural pickup units and a recording unit records the picked up images on a recording medium. A memory unit is used both as a

display buffer to display the images picked up by the plural image pickup units and as a recording buffer to record the picked up images on the recording medium.

Independent Claim 25 as amended is directed to a method for image pickup by a camera in which plural images of an object are picked up with plural image pickup units. Images picked up by the plural image pickup units are displayed and are recorded on a recording medium. Memory is used both as a display buffer to display the plural picked up images and as a recording buffer to record the plural picked up images on the recording medium.

In Applicants' view, Forslund discloses a camera image data processor that provides scan conversion at extremely high speed while allowing static and dynamic correction of image data particularly for a high data output rate CCD image transducer in a confocal imaging system for automated optical inspection in manufacturing processes. Scan conversion and data collation is performed at bit rates in excess of 1 Gigabyte by accessing a double buffer memory with different sequences of addresses covering a field of an image corresponding to a field in the memory during read and write operations. Highly parallel output is provided for confocal height data in a raster line by providing a delay equal to an integral multiple of the access time for a field for each confocally imaged height within a sample.

According to the invention defined in amended Claims 1 and 25, a camera that has display means and recording means uses memory means both as a display buffer to display images picked up by plural image pickup means and as a recording buffer to record the picked-up images on a recording medium. Advantageously, processing to display

plural images and processing to record the plural images on a recording medium are performed in parallel using a lower capacity memory.

Forslund is directed to a measurement system that detects unevenness of a surface by detecting changes in the luminance level of pixels. As noted by the Examiner, it is disclosed at lines 41-45 of column 13 of Forslund "In essence, the apparatus of FIG. 9 includes a pair of random access memories (RAM) 901, 902 which are operated in a ping-pong or double buffer (e.g. with at least two independently operable buffers) fashion to provide simultaneous write and read." As a result, Forslund is restricted to teaching that image processing for display, measurement and extraction and recognition of image features requires acquisition of one set of large amounts of data for which simultaneous write and read of the data in independently operating buffers is advantageous.

Forslund at lines 14-17 of column 1 and at lines 6-14 of column 3 only teaches that "Image processing for display generation or feature measurement, extraction or recognition is perhaps the most computation and storage intensive category of data processing problem commonly encountered at the present time" and "In summary, the present state of the data processing art does not allow real time data acquisition from an optical transducer which fully exploits the capabilities of transducers which are now possible or allow real time processing of such large amounts of data as are required for a desired degree of optical resolution and with sufficient throughput to provide an automated, real time, inspection system suitable for present manufacturing systems for high density integration electronic components." These disclosures are seen as disclosing the state of the art with respect to the adequacy of throughput only in relation to the Forslund

invention of simultaneous write and read of independent buffers and are not seen as suggesting in any manner a single set of buffers for both the different uses of display of plural picked up images and recording of the plural picked up images on a recording medium.

As discussed, the Forslund arrangement only discloses simultaneous reading and writing of independently operating buffers for a single measurement process.

Forslund, however, is devoid of any disclosure of recording plural images on a recording medium and fails in any manner to suggest different uses for the same buffers as in the present invention (i.e., a double buffer for display and a frame memory for recording on a recording medium). More particularly, Forslund is devoid of any suggestion of memory means being used as both 1) a display buffer for display of images picked up by plural image pickup means and 2) a recording buffer for recording images picked up by the same plural image pickup means on a recording medium as in Claims 1 and 25. Accordingly, it is believed that Claims 1 and 25 as amended by this amendment are completely distinguished from Forslund and are allowable.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record. Applicants submit that the amendments to independent Claims 1 and 25 clarify Applicants' invention and serve to reduce any issues for appeal.

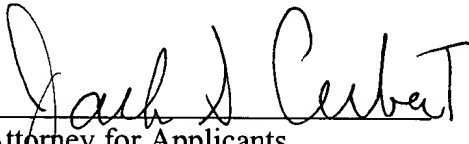
The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the

same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application. The Examiner is respectfully requested to enter this Amendment After Final Action under 37 C.F.R. § 1.116.

Applicants' attorney, C. Phillip Wrist, may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO THE CLAIMS

1. (Twice Amended) A camera comprising:

a plurality of image pickup means for picking up a plurality of
images of an object, respectively;

display means for displaying images picked up by said plurality of
image pickup means; [and]

recording means for recording the images picked up by said plurality
of image pickup means on a recording medium; and

[a plurality of] memory means for use both as a display buffer for
displaying the images picked up by said plurality of image pickup means, and as a
recording buffer for recording the images picked up by said plurality of image pickup
means on said recording medium.
2. (Twice Amended) A camera according to claim 1, wherein when
a [said] plurality of said memory means are used for displaying an image picked up by said
plurality of image pickup means, some of said plurality of memory means are used for a
write operation and the others of said plurality of memory means are used for a read
operation by switching between the write and read operations, whereby said plurality of
memory means are used as a double buffer.

3. (Twice Amended) A camera according to claim 1, wherein when a [said] plurality of said memory means are used for recording an image picked up by said plurality of image pickup means, all of said plurality of [said] memory means are used for write operation in order to record each image picked up by said plurality of image pickup means, and after the write operation is completed, all of said plurality of memory means are used for read operation.

25. (Amended) A method for image pickup by a camera, comprising:
a pickup step of picking up a plurality of images of an object with a plurality of image pickup means, respectively;

a display step of displaying images picked up by said plurality of image pickup means; [and]

a recording step of recording the images picked up by said plurality of image pickup means on a recording medium; and

a storing step of using [a plurality of] memory means both as a display buffer for displaying the plurality of images picked up by said plurality of image pickup means, and as a recording buffer for recording the plurality of images picked up by said plurality of image pickup means on said recording medium.

26. (Amended) A method according to Claim 25, wherein said storing step includes a step of, when a [the] plurality of said memory means are used for

displaying an image picked up by said plurality of image pickup means, using some of the plurality of memory means for a write operation and using the others of the plurality of memory means for a read operation by switching between the write and read operations, whereby the plurality of memory means are used as a double buffer.

27. (Amended) A method according to Claim 25, wherein said storing step includes a step of, when a [the] plurality of said memory means are used for recording an image picked up by the plurality of image pickup means, using all of the plurality of memory means for a write operation in order to record each image acquired by the plurality of image pickup means, and using all of the plurality of memory means for a read operation after the write operation is completed.